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**GROUNDWATER TREATMENT SYSTEM  
QUARTERLY MONITORING REPORT  
THIRD QUARTER 2001**

**AMERICAN CHEMICAL SERVICE NPL SITE  
GRIFFITH, INDIANA**

**MWH File No. 2090601**

**Prepared For:**

**American Chemical Service NPL Site RD/RA Executive Committee  
Griffith, Indiana**

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**Prepared By:**

**MWH  
27755 Diehl Road, Suite 300  
Warrenville, Illinois 60555**

**June 2002**



**MWH**

MONTGOMERY WATSON HARZA

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Prepared by: Travis Klingforth 6/11/02  
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Appendix A	Effluent Analytical Data <ul style="list-style-type: none"><li>• July 25, 2001 Compliance Sample – Laboratory Results</li><li>• August 9, 2001 Compliance Sample – Laboratory Results</li><li>• September 5, 2001 Compliance Sample – Laboratory Results</li></ul>
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## 1.0 INTRODUCTION

MWH, on behalf of the ACS RD/RA Executive Committee, started up the on-site groundwater treatment system at the American Chemical Service NPL Site (ACS Site) in Griffith, Indiana on March 13, 1997. The groundwater treatment plant (GWTP) system was designed to treat groundwater from the Perimeter Groundwater Containment System (PGCS) and the Barrier Wall Extraction System (BWES). The original treatment consisted of a phase-separator for oil and free product removal, equalization tanks, a UV-oxidation unit for destruction of organic constituents, and an air stripper to remove methylene chloride and other organics. The treatment also included a chemical precipitation and clarification unit to remove metals, a sand filter to remove suspended solids, and activated carbon vessels for final polishing of the treated groundwater.

In 2001 an activated sludge treatment process was added to the process to reduce the volatile and semivolatile organic compounds (VOCs and SVOCs) in the collected groundwater. The activated sludge treatment process also reduces the amount of activated carbon required in the treatment process. An aerated equalization tank was also added to the GWTP in 2001 to remove VOCs from the collected groundwater, oxidize metals to increase metals removal efficiency in the chemical precipitation unit, and equalize groundwater flow through the GWTP. The activated sludge system and aeration tank have been fully integrated into the process along with the other upgrade components. Startup and optimization of the catalytic oxidizer/scrubber air treatment unit was conducted during the first quarter of 2001.

The treated effluent from the treatment system is discharged to the nearby wetlands, west of the treatment system, in accordance with Agency approvals. This Groundwater Treatment System report summarizes effluent analytical data and water level gauging data collected from July 2001 through September 2001. This report also summarizes the sediment analytical data from the annual sediment sample collected during August 2001 at the wetlands discharge point of the GWTP.

## 2.0 COMPLIANCE MONITORING

### 2.1 INTRODUCTION

Effluent samples were collected from the treatment system to demonstrate compliance with the discharge limits (Table 2.1) established by Indiana Department of Environmental Management (IDEM) and United States Environmental Protection Agency (U.S. EPA). The approved Performance Standard Verification Plan (PSVP) requires quarterly effluent sampling for biological oxygen demand (BOD), total suspended solids (TSS), SVOCs, metals, and polychlorinated biphenyls (PCBs) in the system, and monthly effluent sampling for VOCs, as shown in the table below. To be conservative, the effluent sampling is being conducted on a monthly basis for all analytes. The samples will continue to be collected on a monthly basis until the treatment system is operating in a relatively steady state after completion and optimization of the groundwater treatment plant upgrades.

Sampling and analyses were performed in accordance with the Agency-approved PSVP Quality Assurance Project Plan (QAPP) prepared by MWH for the ACS RD/RA Executive Committee in April 1997. Quality control measures were also instituted in accordance with the PSVP and QAPP. The following table and paragraphs present details on sampling and analyses, and also summarize the analytical data for the treatment system effluent.

**Sampling Frequency Schedule – Groundwater Treatment System**

Analytes	Cumulative Time From Startup*	Frequency
Flowrate and pH	–	Continuous
BOD, TSS, SVOCs and Metals	181 days onward	Once per quarter
VOCs	31 days onward	Once per month
PCBs	181 days onward	Once per quarter
PCBs in Sediment (one location)	–	Once per year

\*Note: System was started up on March 13, 1997

### 2.2 SAMPLING AND ANALYSES

Effluent samples were collected each month during the third quarter 2001. Samples were collected on the following dates for this reporting period:

- July 25, 2001
- August 9, 2001
- September 5, 2001

The above effluent samples were collected directly from a sample tap on the effluent line of the treatment system.

The samples were placed in contaminant-free containers, as specified in the U.S. EPA Specifications and Guidance for Obtaining Contaminant-Free Sample Containers (U.S. EPA, 1992). Appropriate sample containers and preservatives, as specified in the QAPP, were used to collect and preserve the samples. Following sample collection, the sample containers were refrigerated at or below 4° C in coolers. Chain-of-Custody forms were prepared to track the transfer of samples from the treatment system to the laboratories. In accordance with the approved QAPP, the effluent water samples were analyzed by the following analytical methods for the following parameters:

<u>Parameter</u>	<u>Analytical Method</u>
VOCs	SW-846 8260B
SVOCs	SW-846 8270C
Pentachlorophenol	SW-846 8270C and SIM
Pesticides/PCBs	EPA 608/SW-846 8081/8082
Metals (Excluding Mercury)	SW-846 6010
General Water Quality Parameters (TSS and BOD-5)	EPA 160.2 and 405.1
Mercury	SW-846 7470
pH	EPA 150.1

The sediment sample and associated quality control samples were analyzed for PCBs using analytical method SW-846-8082.

## 2.3 ANALYTICAL RESULTS

### GWTP Effluent Samples

The effluent monitoring data, summarized in Table 2.2, verifies that the system effluent was consistently compliant with the discharge limits presented in Table 2.1. No exceedences were reported for the Third Quarter 2001 sampling events. The analytical data sheets for the compliance samples are provided in Appendix A.

Compuchem Laboratory of Cary, North Carolina analyzed the data. Laboratory Data Consultants (LDC) of Carlsbad, California performed third party data validation in accordance with the U.S. EPA National Functional Guidelines for Organic/Inorganic Data Review. Validation qualifiers are listed in Table 2.2 and are written in the margin of the analytical data sheets provided in Appendix A.

The “non-detect” results for the July 25, August 9, and September 5, 2001 samples for the analytes acetone and 2-butanone have been flagged “R” by LDC for “rejected” due to low relative response factor values. This is a common problem for acetone, 2-butanone, and other ketones. This issue has arisen before and been discussed in previous quarterly reports (for example, see Section 2.3 of Second Quarter 2001 Groundwater Treatment System

Quarterly Monitoring Report, MWH, December 2001). As reported in the First Quarter 2001 Groundwater Treatment System Quarterly Monitoring Report, a new QAPP has been prepared. It was submitted to the Agencies in March 2001 and was approved November 2001. It contains updated protocols that should address this issue.

### **Sediment Sample**

MWH conducted an investigation of the wetland areas north and west of the ACS site in May 1996 after earlier Remedial Investigation (RI) indicated the presence of PCBs. Locations for soil/sediment samples were selected by representatives of the U.S. EPA and MWH to more clearly delineate the extent and concentrations of PCBs in the wetland. Samples were collected from several locations across the wetlands. Results of this sampling indicated that residual PCBs, including Aroclor-1254, were present throughout the wetland. The wetland investigation is documented in the Phase I Technical Memorandum Wetland Investigation (MWH, July 1996) and the Phase II Technical Memorandum Wetland Investigation (MWH, February 1997). A summary of the sampling results and a map of the sampling locations are included in Appendix C.

Since 1998, MWH has collected an annual sediment sample and associated quality control samples from the GWTP outfall in accordance with the PSVP to help determine if PCB accumulation is occurring at the GWTP discharge location. In 2000, MWH collected the annual sediment sample and analyzed for PCBs during the first quarter. However, the unusual amount of precipitation during the first and second quarters of 2001 prevented a sediment sample from being taken until August 2001. The high levels of standing water in the wetland area did not allow an accurate sample to be collected from the GWTP outfall location.

The annual sediment sample was collected on August 21, 2001 from the GWTP outfall location shown on Figure 2.1. The sample was analyzed for PCBs by Compuchem and the data was validated by LDC. Aroclor-1254 was detected (Compuchem reported results of 73 ug/kg in the sample and 39 ug/kg in the duplicate). Both the sample and the duplicate were given a "P" flag by Compuchem, indicating that the relative percent difference (RPD) between the two gas chromatograph columns (GC) results for each sample was greater than 25%. It is Compuchem's standard practice to report the highest detected value for each sample, however this means that Compuchem's reported results are biased high and the actual PCB concentrations in the soil may be lower.

Although the concentrations of Aroclor-1254 in the sediment sample and field duplicate collected August 2001 were slightly higher than the previous samples collected February 2000, the concentrations are still far below the 1,000 ug/kg remediation objective used in the August 2001 PCB-Impacted Soil Wetland Excavation. In addition, the variance between the August 2001 annual sediment sample (73 ug/kg) and the duplicate sample (39 ug/kg), as well as the variance within each sample evidenced by the "P" flag, demonstrates the variability of analytical results when analyzing PCBs at very low concentrations.



There have been no GWTP effluent exceedences of PCBs since the February 2000 sediment sample, demonstrating that there is little likelihood of PCBs accumulating in the wetlands due to GWTP discharge. MWH will continue to collect annual sediment samples from the GWTP outfall point, according to the PSVP, to monitor for any potential accumulation of PCBs.

A summary of the analytical data for the annual sediment samples, collected in December 1998, February 2000, and August 2001, are summarized in Table 2.3. Analytical data for the August 2001 sample are included in Appendix B.

### 3.0 TREATMENT SYSTEM PROCESS MODIFICATIONS

During the third quarter of 2001, the GWTP continued to treat groundwater collected by the BWES and PGCS. During this monitoring period, no significant equipment modifications were made to the GWTP. Minor short-term modifications were made, however, to the GWTP treatment process to facilitate other activities taking place on the Site. During August and September 2001 up to 99% of the GWTP influent was from the wetland area west of the GWTP. The wetland area was being dewatered to facilitate the excavation of polychlorinated biphenyl (PCB)-impacted soil taking place in the wetland.

Additionally, from July to September 2001 GWTP treated effluent was directed to south of the railroad tracks in order to decrease the total purging required to dewater the wetland excavation area. During most of August 2001 this treated effluent was specifically directed to a 20,000-gallon fract tank located south of the railroad tracks that bisect the Site. This treated effluent was spread during cover construction to achieve the required moisture in the clay being installed in the Off-Site Area as part of the interim cover. Standard discharge to the wetland area resumed in late September 2001 upon the completion of the wetland excavation work.

#### 4.0 PGCS AND BWES GAUGING ACTIVITIES

The PGCS trench groundwater extraction wells were operated in "auto" mode continuously throughout the months of July, August, and September 2001. In "auto" mode, each of the PGCS extraction wells are set to turn on or off automatically based on water levels within the Aeration Equalization Tank (T-102). This mode is used to control the flowrate through the treatment system. The GWTP also received influent from the BWES during the third quarter 2001.

In accordance with the PSVP for the Site, a discussion on the effect of the PGCS and BWES on the water table near the Site is presented in each quarterly monitoring report. This section presents a discussion on the groundwater elevation findings during the months of July, August, and September 2001. Groundwater elevation measurements were collected throughout the Site on September 25, 2001 as part of the quarterly groundwater monitoring program. The groundwater elevations and resulting contours outside the barrier wall are shown on Figure 4.1. However, to keep track of the groundwater table inside the barrier wall, water levels were collected from the BWES piezometers (P32, P49 and P96) on a regular basis, as shown in the table below. Piezometer P3, which has been measured in the past and reported in this section, was destroyed during the preparation work for the installation of the Off-Site Area Interim Cover in early June 2001. The levels from piezometers P32, P49, and P96 are shown in the table below and are depicted graphically on Figure 4.2.

Water Table Elevation				
Date	P3	P32	P49	P96
July 13, 2001	NA	634.92	632.08	624.89
July 27, 2001	NA	635.22	633.58	630.59
August 3, 2001	NA	635.12	633.88	625.39
August 17, 2001	NA	635.02	634.18	631.29
August 24, 2001	NA	635.22	633.78	630.59
August 31, 2001	NA	636.02	635.08	632.09
September 7, 2001	NA	635.62	633.68	632.39
September 14, 2001	NA	635.32	633.28	632.79
September 28, 2001	NA	636.12	633.78	627.79

NA = Not sampled. Piezometer P3 was destroyed during the construction of the Off-Site Area Interim Engineered Cover

The barrier wall was constructed to contain a contaminated zone under the Site. The BWES was installed to collect the impacted water within the barrier wall. A series of 16 piezometers were installed in eight pairs, one piezometer of each pair on either side of the barrier wall at each of the BWES trench locations. This allows measurement and tracking of water levels in order to ensure that the barrier wall is serving its designed function.

During the installation of the Off-Site Area Interim Cover in June, July, and August 2001, four of the five piezometer pairs in the Off-Site Area were removed: P97 and P98, P99 and P100, P101 and P102, and P103 and P104. P95 and P96 were left in place. After the completion of the interim cover in September 2001, additional piezometers were added in the Off-Site Area to allow for continued monitoring of water levels. Four new barrier wall monitoring well pairs were added: P109 and P110, P111 and P112, P114 and P115, and P116 and P117. Two additional monitoring wells, P113 and P118, were also added in the Off-Site Area and are shown on Figure 4.3. They will not be included in this discussion because they are not barrier wall piezometer pairs.

Groundwater elevations inside and outside the barrier wall were monitored on September 25, 2001. Figure 4.3 illustrates these groundwater elevations. Fluctuations in the gradient across the barrier wall occur due to seasonal groundwater conditions, pumping rates from the BWES, and infiltration into the Site groundwater. However, the groundwater elevations measured in the piezometers indicated that the elevations inside the barrier wall were 2.11 feet to 5.54 feet higher than the elevations outside the barrier wall. The one exception was at piezometers P95 and P96, where the water level was 6.18 feet higher outside the wall due to local dewatering effect at extraction well EW-11. This data demonstrates that the barrier wall is successfully performing the intended function of isolating and containing the groundwater from the known source areas of the Site inside the barrier wall.

Water levels from the piezometers measured September 25, 2001 are tabulated below:

Piezometer	Location <sup>(1)</sup>	Water Level	Difference <sup>(2)</sup>
P93 <sup>3</sup>	Outside	NM	NA
P49 <sup>3</sup>	Inside	634.08	
P95	Outside	632.22	-6.18 <sup>4</sup>
P96	Inside	626.04	
P105	Outside	631.72	4.17
P106	Inside	635.89	
P107	Outside	630.69	5.54
P108	Inside	636.23	
P109	Outside	631.85	2.20
P110	Inside	634.05	
P111	Outside	631.44	2.11
P112	Inside	633.55	
P115	Outside	631.45	NA
P114 <sup>5</sup>	Inside	NM	
P117	Outside	631.05	2.86
P116	Inside	633.91	

Notes:

- Location indicates inside or outside the barrier wall.
  - A positive value indicates that the water level is higher inside the barrier wall. A negative value indicates that the water level is lower inside the barrier wall.
  - Piezometer P94 has been destroyed. Therefore the groundwater level from piezometer P49 was used instead. Piezometer P93 has also been destroyed.
  - At this location, the water level is lower inside the barrier wall due to local dewatering from extraction well EW-11.
  - P114 could not be measured because the top of the piezometer casing was too high to measure. It had not yet been trimmed to a lower height.
- NA Value could not be calculated from single measurement.  
 NM Well not measured for reasons noted above.

It is not the intent to continuously operate with the higher groundwater levels inside the barrier wall. As part of the optimization of the groundwater treatment plant and BWES upgrades, MWH began active dewatering of the Off-Site Area through increased groundwater pumping rates on September 25, 2001. As dewatering progresses, the water level in the barrier wall will begin to decrease for operation of the in-situ soil vapor extraction (ISVE) systems.

TMK/SAW/RAA/PJV/jmf  
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 2090603.030102



**Table 2.1**  
**Groundwater Treatment System Effluent Discharge Limits**  
**American Chemical Service NPL Site**  
**Griffith, Indiana**

Groundwater Quality Parameter	Effluent Standard (Limit)
<b>General Water Quality Parameters</b>	
PH	6 - 9 S.U.
BOD-5	30 mg/L
TSS	30 mg/L
<b>Inorganics</b>	
Arsenic	50 µg/L
Beryllium	NE
Cadmium	4.1 µg/L
Manganese	NE
Mercury	0.02 µg/L (w/DL = 0.64)
Selenium	8.2 µg/L
Thallium	NE
Zinc	411 µg/L
<b>Volatile Organics</b>	
Acetone	6,800 µg/L
Benzene	5 µg/L
2-Butanone	210 µg/L
Chloromethane	NE
1,4 – Dichlorobenzene	NE
1,1 – Dichloroethane	NE
1,2 – Dichloroethene – cis	70 µg/L
Ethylbenzene	34 µg/L
Methylene chloride	5 µg/L
Tetrachloroethene	5 µg/L
Trichloroethene	5 µg/L
Vinyl chloride	2 µg/L
4 – Methyl - 2 – pentanone	15 µg/L
<b>Semi-Volatile Organics</b>	
bis(2 – Chloroethyl) ether	9.6 µg/L
bis(2 – Ethylhexyl) phthalate	6 µg/L
Isophorone	50 µg/L
4 – Methylphenol	34 µg/L
Pentachlorophenol	1 µg/L
<b>PCBs</b>	
PCBs	0.00056 µg/L (w/DL = 0.1 to 0.9)

Notes:

NE = No effluent limit established.

DL = Detection limit

**Table 2.2**  
**Summary of Effluent Analytical Results - Third Quarter 2001**  
**Groundwater Treatment System**  
**American Chemical Service NPL Site**  
**Griffith, Indiana**

Event Date	Month 50 7/25/01	Month 51 8/9/01	Month 52 9/5/01	Effluent Limits	Lab Reporting
pH	7.83 /J	7.74 /J	7.92	6-9	none
TSS	ND /UJ	ND	ND	30	10
BOD	ND /UJ	ND	ND	30	2
Arsenic	7.6 B/U	6.2 B/U	3.1 B/U	50	3.4
Beryllium	0.12 B/U	ND	ND	NE	0.2
Cadmium	0.86 B/U	1.1 B/U	ND	4.1	0.3
Manganese	36.2	5.4 B/	18.8	NE	10
Mercury	ND	ND	ND	0.02 (w/DL = 0.64)	0.1
Selenium	ND	ND	ND	8.2	4.3
Thallium	5.5 B/U	8 B/U	ND	NE	5.7
Zinc	ND	35.7	1.8 B/	411	1.2
Benzene	0.02 J/	0.04 J/	ND	5	0.5
Acetone	2 JB/R	ND /R	ND /R	6,800	3
2-Butanone	ND /R	ND /R	ND /R	210	3
Chloromethane	ND	ND	ND	NE	0.5
1,4-Dichlorobenzene	ND	0.1 J/	0.08 JB/0.5 UJ	NE	0.5
1,1-Dichloroethane	ND	ND	ND	NE	0.5
cis-1,2-Dichloroethene	ND	ND	ND	70	0.5
Ethylbenzene	ND	0.05 J/	ND	34	0.5
Methylene chloride	0.2 JB/0.5 U	0.2 JB/0.5 U	ND /UJ	5	0.6
Tetrachloroethene	ND	ND	ND	5	0.5
Trichloroethene	ND	0.04 J/	ND	5	0.5
Vinyl chloride	ND	ND	ND	2	0.5
4-Methyl-2-pentanone	ND	ND /UJ	ND	15	3
bis (2-Chloroethyl) ether	ND	ND	ND	9.6	9.6
bis(2-Ethylhexyl) - phthalate	ND	ND	ND	6	6
4 - Methylphenol	ND	ND	ND	34	10
Isophorone	ND	ND	ND	50	10
Pentachlorophenol	ND	ND	ND	1	1
PCB/Aroclor-1016	ND	ND	ND	0.00056 (w/DL = 0.1 to 0.9)	0.5
PCB/Aroclor-1221	ND	ND	ND	0.00056 (w/DL = 0.1 to 0.9)	0.92*
PCB/Aroclor-1232	ND	ND	ND	0.00056 (w/DL = 0.1 to 0.9)	0.5
PCB/Aroclor-1242	ND	ND /UJ	ND	0.00056 (w/DL = 0.1 to 0.9)	0.5
PCB/Aroclor-1248	ND	ND /UJ	ND	0.00056 (w/DL = 0.1 to 0.9)	0.5
PCB/Aroclor-1254	ND	ND /UJ	ND	0.00056 (w/DL = 0.1 to 0.9)	0.5
PCB/Aroclor-1260	ND	ND /UJ	ND	0.00056 (w/DL = 0.1 to 0.9)	0.5

**Notes:**

All data validated in accordance with the U.S. EPA National Functional Guidelines for Organic Data Review

Shaded cells indicate discharge exceedances

pH data is expressed in S.U.

TSS and BOD5 data is expressed in mg/L

Metals, VOC, SVOC and PCB data is expressed in ug/L

ND = Not detected

NE = No effluent limit established.

NA = Sample not analyzed for this compound

\* = Approved SW-846 method is incapable of achieving effluent limit.

**Suffix Definitions:**

/ = Data qualifier added by laboratory

/ = Data qualifier added by data validator

B = Compound is also detected in the blank

E = Compound exceeds the upper level of calibration range of instrument

J = Result is detected below the reporting limit and is an estimated concentration

Q = Sample was analyzed out of the recommended holding time

R = Quality control indicates the data is not usable

JB = Analyte is detected in the compliance sample below the reporting limit and is an estimated concentration and the compound is also detected in the method blank resulting in a potential high bias

U = Analyte is not detected at or above the indicated concentration

UB = Analyte is not detected at or above the indicated concentration due to blank contamination

UJ = Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value



**Table 2.3**  
**Summary of Sediment Analytical Results**  
**Groundwater Treatment System**  
**American Chemical Service NPL Site**  
**Griffith, Indiana**

PCB Compound	Results (ug/kg)				
	12/4/98	2/3/00	2/3/00 DUP	8/21/01	8/21/01 DUP
Aroclor-1016	ND (33)	ND (59)	ND (79)	ND (62) /UJ	ND (71)
Aroclor-1221	ND (33)	ND (77)	ND (100)	ND (82) /UJ	ND (92)
Aroclor-1232	ND (33)	ND (59)	ND (79)	ND (62) /UJ	ND (71)
Aroclor-1242	ND (33)	ND (41)	ND (55)	ND (43) /UJ	ND (49) /UJ
Aroclor-1248	ND (33)	ND (41)	ND (55)	ND (43) /UJ	ND (49) /UJ
Aroclor-1254	ND (33)	22 J/	15 J/	73 P/J	39 JP/J
Aroclor-1260	ND (33)	ND (59)	ND (79)	ND (62) /UJ	ND (71) /UJ
<b>Total PCBs</b>	<b>ND</b>	<b>22</b>	<b>15</b>	<b>73</b>	<b>39</b>

Notes:

1. ND ( ) = Compound was not detected. The detection limit is included in parentheses
2. December 4, 1998 sample was analyzed by Quanterra  
February 3, 2000 and August 21, 2001 samples were analyzed by Compuchem
3. DUP = Duplicate sample

Suffix Definitions:

\_ / = Data qualifier added by laboratory

/ \_ = Data qualifier added by data validator

B = Compound is also detected in the blank

J = Result is detected below the reporting limit and is an estimated concentration

P = The Relative Percent Difference (RPD) between the two GC column values is greater than 25%. The higher value has been reported.

JB = Analyte is detected in the sample below the reporting limit and is an estimated concentration. The compound is also detected in the method blank resulting in a potential high bias.

UB = Analyte is not detected at or above the indicated concentration due to blank contamination.

UJ = Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

JP = Result is detected below the reporting limit and is an estimated concentration. Also, the Relative Percent Difference (RPD) between the two GC column values is greater than 25%. The higher value has been reported.





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AMERICAN CHEMICAL SERVICE, INC.  
GRIFFITH, INDIANA

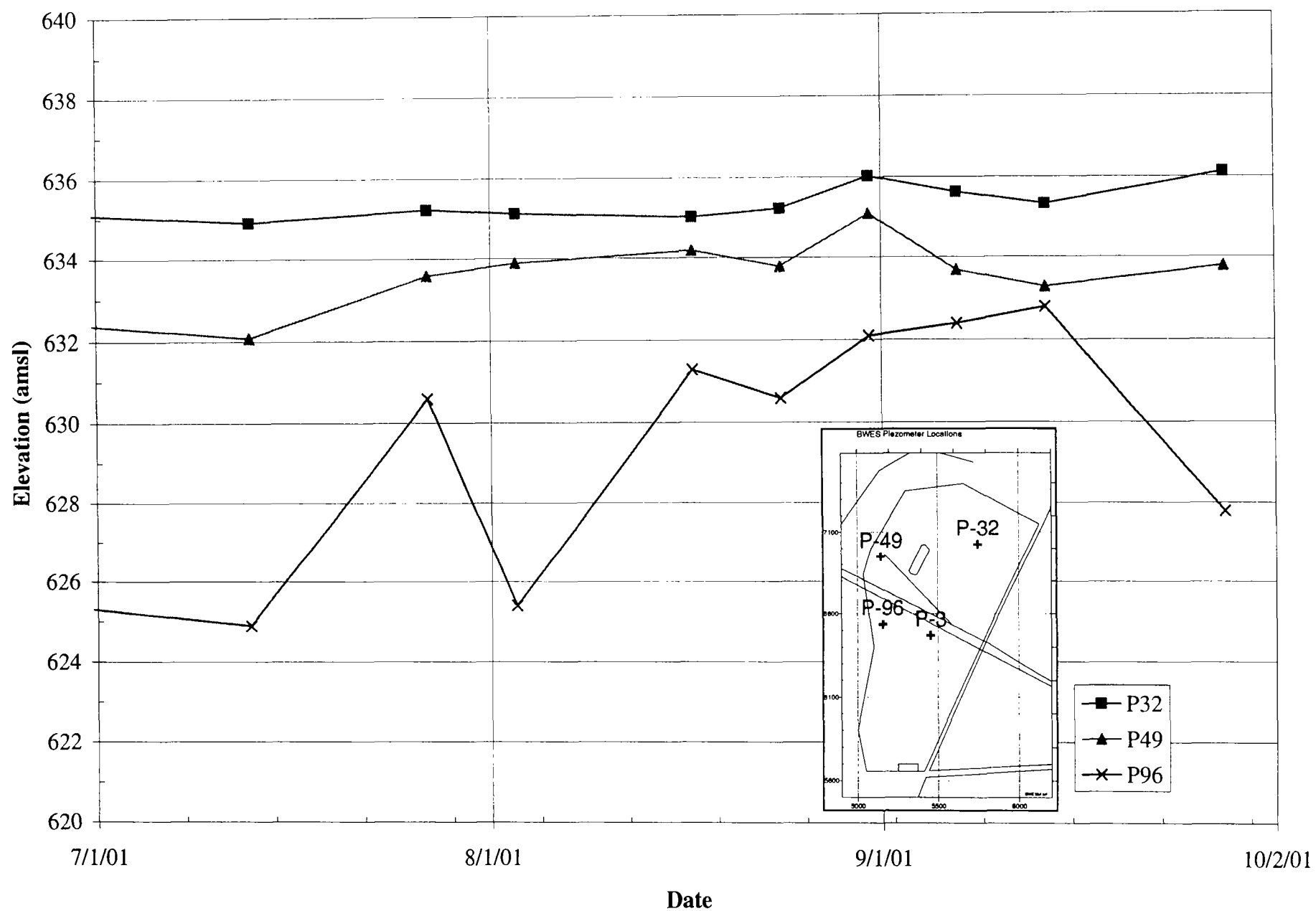
ANNUAL SEDIMENT SAMPLE  
COLLECTION LOCATION

FIGURE

2.1

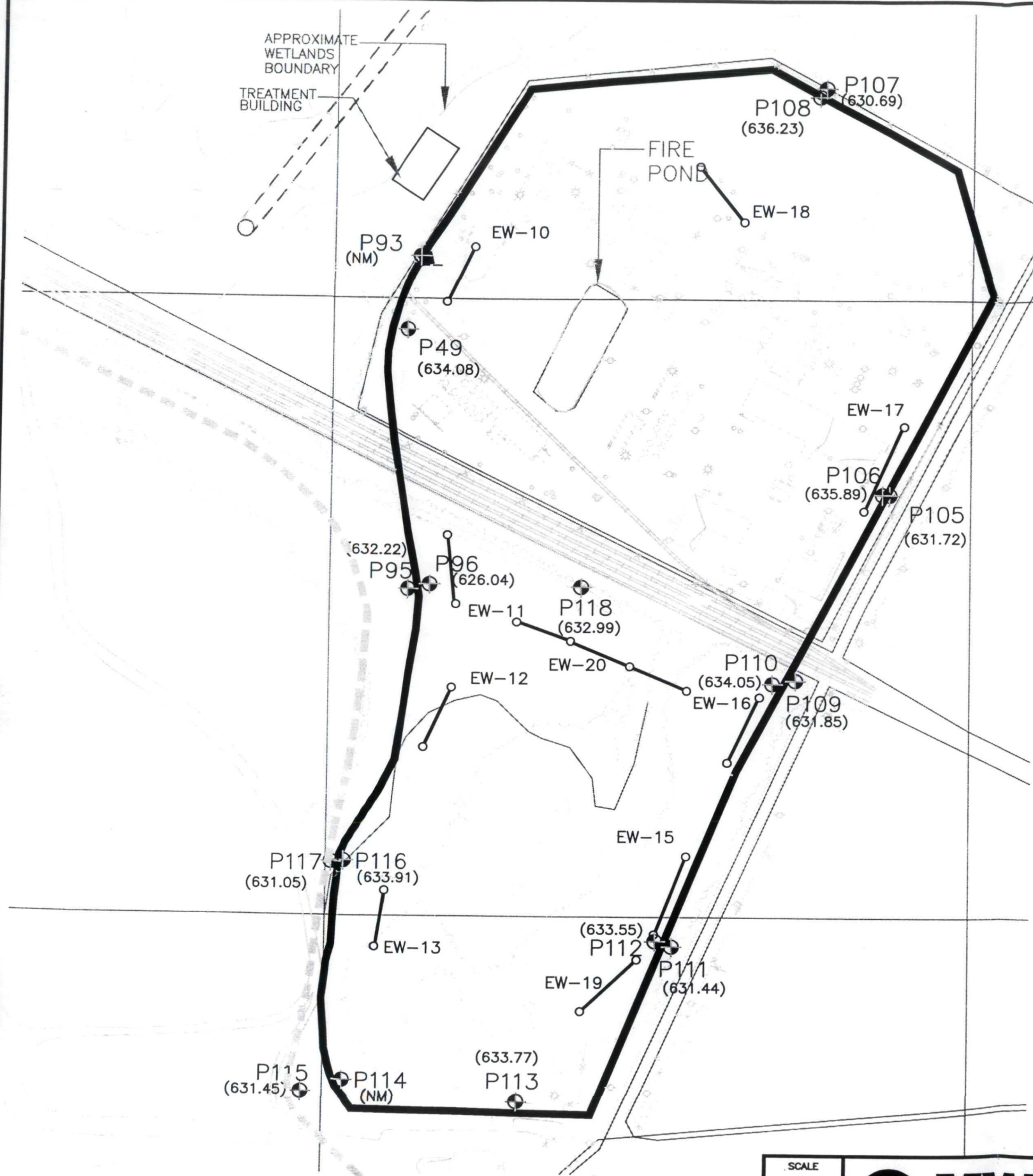








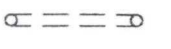






FILE: J:/209/0601 ACS/0116 GWTP/DRAWINGS/20906010116B4.dwg

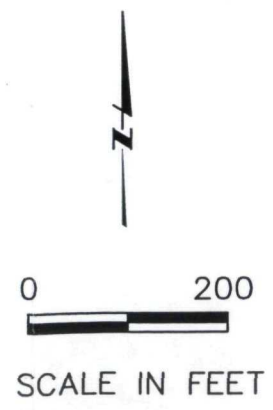


**LEGEND**

-  P106    PIEZOMETER LOCATION AND DESIGNATION
-  (633.01)    GROUNDWATER ELEVATION
-     BARRIER WALL
-     APPROXIMATE GRIFFITH LANDFILL BOUNDARY
-     PERIMETER GROUND WATER CONTAINMENT SYSTEM EXTRACTION TRENCH
-  EW-11    BWES EXTRACTION TRENCH LOCATION AND DESIGNATION
-  (NM)    NOT MEASURED

**NOTES**

1. GROUNDWATER ELEVATIONS WERE MEASURED AT THE SITE ON SEPTEMBER 25, 2001



SCALE  
1"=200'



AMERICAN CHEMICAL SERVICE, INC.  
GRIFFITH, INDIANA

WATER TABLE ELEVATIONS  
ACROSS THE BARRIER WALL  
SEPTEMBER 2001

FIGURE  
4.3



**APPENDIX A**  
**EFFLUENT ANALYTICAL DATA**



**July 25, 2001 Compliance Sample  
Laboratory Results**

SW-846

1-CC

## CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

EFFLUENT

Lab Name: CompuChem

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

NRAS No.: \_\_\_\_\_

OG No.: QJ1024

Matrix (soil/water): WATER

Lab Sample ID: QJ1024-1

Date Received: 7/26/01

% Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	1.00	U			7/31/01
pH	7.830				8/9/01

UJ  
J

Se 10801

Comments:

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ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

TEST AMERICA  
Attn: CAROL YANDELL  
4004 BARRETT DRIVE  
SUITE 105  
RALEIGH, NC 27609-

REPORT DATE: 08/02/01

ASC-89

SAMPLE NUMBER- 186815 SAMPLE ID- EFFLUENT  
DATE SAMPLED- 07/25/01  
DATE RECEIVED- 07/26/01 SAMPLER- NOT SPECIFIED  
TIME RECEIVED- 1255 DELIVERED BY- CS

SAMPLE MATRIX- WW  
TIME SAMPLED- 1400  
RECEIVED BY- ALT

Page 1 of 1

PROJECT NAME : ACS-89

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT UNITS	PQL
BIOCHEMICAL OXYGEN DEMAND	EPA 405.1	07/27/01	LEB	<2 mg/L <i>WJ</i>	2

PQL = Practical Quantitation Limit  
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR

*[Signature]*

*Sc 10801*

## INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBERTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: QJ1024Matrix (soil/water): WATERLab Sample ID: QJ1024-1Level (low/med): LOWDate Received: 07/26/01% Solids: 0.0Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	103			P
7440-36-0	Antimony	2.5	U		P
7440-38-2	Arsenic	7.6	B		P
7440-39-3	Barium	57.2			P
7440-41-7	Beryllium	0.12	B		P
7440-43-9	Cadmium	0.86	B		P
7440-70-2	Calcium	73000			P
7440-47-3	Chromium	0.71	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	0.80	U		P
7439-89-6	Iron	12.4	U		P
7439-92-1	Lead	1.6	U		P
7439-95-4	Magnesium	25400			P
7439-96-5	Manganese	36.2			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	12.5			P
7440-09-7	Potassium	9490			P
7782-49-2	Selenium	3.7	U		P
7440-22-4	Silver	0.70	U		P
7440-23-5	Sodium	35900			P
7440-28-0	Thallium	5.5	B		P
7440-62-2	Vanadium	1.3	B		P
7440-66-6	Zinc	5.8	U		P

Color Before: COLORLESSClarity Before: CLEAR

Texture: \_\_\_\_\_

Color After: COLORLESSClarity After: CLEAR

Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Method: 8260B

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QJ1024

Matrix: (soil/water) WATER

Lab Sample ID: QJ1024-1

Sample wt/vol: 25 (g/ml) ML

Lab File ID: QJ1024-1RB71

Level: (low/med) LOW

Date Received: 07/26/01

% Moisture: not dec. \_\_\_\_\_

Date Analyzed: 08/08/01

GC Column: SPL-624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL)

Soil Aliquot Volume: \_\_\_\_\_ (uL)

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

CAS NO.

COMPOUND

74-87-3	Chloromethane	0.5	U	
75-01-4	Vinyl Chloride	0.5	U	
74-83-9	Bromomethane	0.5	U	
75-00-3	Chloroethane	0.5	U	
75-35-4	1,1-Dichloroethene	0.5	U	
75-15-0	Carbon disulfide	0.1	JB	0.5UJ
67-64-1	Acetone	2	JB	<del>0.5U</del> R
75-09-2	Methylene Chloride	0.2	JB	0.5U
156-60-5	trans-1,2-Dichloroethene	0.5	U	
75-34-3	1,1-Dichloroethane	0.5	U	
156-59-2	cis-1,2-Dichloroethene	0.5	U	
78-93-3	2-butanone	3	U	R
67-66-3	Chloroform	0.5	U	
71-55-6	1,1,1-Trichloroethane	0.5	U	
56-23-5	Carbon Tetrachloride	0.5	U	UJ
71-43-2	Benzene	0.32	J	
107-06-2	1,2-Dichloroethane	0.5	U	
79-01-6	Trichloroethene	0.5	U	
78-87-5	1,2-Dichloropropane	0.5	U	
75-27-4	Bromodichloromethane	0.5	U	
10061-01-5	cis-1,3-Dichloropropene	0.5	U	
108-10-1	4-Methyl-2-pentanone	3	U	
108-88-3	Toluene	0.4	JB	0.5U
10061-02-6	trans-1,3-Dichloropropene	0.5	U	
79-00-5	1,1,2-Trichloroethane	0.5	U	
127-18-4	Tetrachloroethene	0.5	U	
591-78-6	2-hexanone	3	U	
124-48-1	Dibromochloromethane	0.5	U	UJ
108-90-7	Chlorobenzene	0.5	U	
100-41-4	Ethylbenzene	0.5	U	
108-38-3	m,p-Xylene	1	U	
95-47-6	o-Xylene	1.5	U	
100-42-5	Styrene	0.5	U	

FORM 1 VOA

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FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Method: 8260B

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QJ1024

Matrix: (soil/water) WATER

Lab Sample ID: QJ1024-1

Sample wt/vol: 25 (g/ml) ML

Lab File ID: QJ1024-1RB71

Level: (low/med) LOW

Date Received: 07/26/01

% Moisture: not dec. \_\_\_\_\_

Date Analyzed: 08/08/01

Column: SPL-624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL)

Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

75-25-2-----Bromoform	0.5	U
79-34-5-----1,1,2,2-Tetrachloroethane	0.5	U
106-46-7-----1,4-Dichlorobenzene	0.5	U
540-59-0-----1,2-Dichloroethene (total)	0.5	U
1330-20-7-----Xylene (total)	0.5	U

UJ

sc 10801

FORM 1 VOA

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract:

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QJ1024

Matrix: (soil/water) WATER

Lab Sample ID: QJ1024-1

Sample wt/vol: 1025 (g/mL) ML

Lab File ID: QJ1024-1B64

Level: (low/med) LOW

Date Received: 07/26/01

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 07/27/01

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 07/31/01

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
111-44-4-----	Bis(2-chloroethyl) ether_____	9.4	U
106-44-5-----	4-Methylphenol_____	9.8	U
78-59-1-----	Isophorone_____	9.8	U
117-81-7-----	bis(2-ethylhexyl) Phthalate_____	5.9	U

SC 10801

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract:

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QJ1024

Matrix: (soil/water) WATER

Lab Sample ID: QJ1024-1

Sample wt/vol: 1025 (g/mL) ML

Lab File ID: QJ1024-1B70

Level: (low/med) LOW

Date Received: 07/26/01

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 07/27/01

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 08/01/01

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CAS NO.

COMPOUND

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

87-86-5-----Pentachlorophenol

0.98

U

SC 10801

FORM I SV



7161 A

1D  
GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract: PCB 8082

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QJ1024

Matrix: (soil/water) WATER

Lab Sample ID: QJ1024-1

Sample wt/vol: 1025 (g/mL) ML

Lab File ID: \_\_\_\_\_

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Received: 07/26/01

Extraction: (SepF/Cont/Sonc) SEPF

Date Extracted: 07/27/01

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 07/29/01

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

Sulfur Cleanup: (Y/N) N

CAS NO.

COMPOUND

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

12674-11-2-----Aroclor-1016	0.49	U
11104-28-2-----Aroclor-1221	0.98	U
11141-16-5-----Aroclor-1232	0.49	U
53469-21-9-----Aroclor-1242	0.49	U
12672-29-6-----Aroclor-1248	0.49	U
11097-69-1-----Aroclor-1254	0.49	U
11096-82-5-----Aroclor-1260	0.49	U

SC 10801

**August 9, 2001 Compliance Sample  
Laboratory Results**

SW-846

1-CC

## CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

EFFLUENT

Lab Name: CompuChem

Contract: \_\_\_\_\_

Lab Code: \_\_\_\_\_

Case No.: \_\_\_\_\_

NRAS No.: \_\_\_\_\_

Site No.: QL1024Matrix (soil/water): WATERLab Sample ID: QL1024-1Date Received: 8/10/01% Solids: 0.00Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	1.00	U			8/16/01
pH	7.740				8/16/01

Σ 10801

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# TestAmerica

INCORPORATED

## ANALYTICAL REPORT

COMPUCHEM 2303  
DIANE BYRD  
501 MADISON AVENUE  
MARY, NC 27513

Lab Number: 01-A111720  
Sample ID: EEFLUENT  
Sample Type: WATER  
Site ID:

Project:  
Project Name: ACS-89  
Sampler:

Date Collected: 8/9/01  
Time Collected: 14:00  
Date Received: 8/11/01  
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Analysis Date	Analysis Time	Analyst	Method	Batch
BOD Set Up						8/11/01	22:00			
BOD 5 Day	ND	mg/l	2.00	2.00		8/16/01	21:30	Weatherly	405.1	8997
*MISCELLANEOUS CHEMISTRY*										
PH	7.80	pH Units			1	8/14/01	9:54	K. Bundy	150.1	8854

ND = Not detected at the report limit.

# = Recovery outside Laboratory historical or method prescribed limits.

These results relate only to the items tested.  
This report shall not be reproduced except in full and with  
permission of the laboratory.

Report Approved By: Paul E. Lane, Jr.

Report Date: 8/17/01

Paul E. Lane, Jr., Lab Director  
Michael H. Dunn, M.S., Technical Director  
Johnny A. Mitchell, Dir. Technical Serv.  
Eric S. Smith, Assistant Technical Director

Gail A. Lage, Technical Serv.  
Glenn L. Norton, Technical Serv.  
Kelly S. Comstock, Technical Serv.  
Pamela A. Langford, Technical Serv.

Laboratory Certification Number: 387

End of Sample Report.

## SW846 METALS

1

## INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: QL1024Matrix (soil/water): WATERLab Sample ID: QL1024-1Level (low/med): LOWDate Received: 08/10/01Solids: 0.0Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	6.2	B		P
7440-41-7	Beryllium	0.40	U		P
7440-43-9	Cadmium	1.1	B		P
7439-96-5	Manganese	5.4	B		P
7439-97-6	Mercury	0.64	U		CV
7782-49-2	Selenium	2.8	U		P
7440-28-0	Thallium	8.0	B		P
7440-66-6	Zinc	35.7			P

SC 10801

Color Before: COLORLESSClarity Before: CLEAR

Texture: \_\_\_\_\_

Color After: COLORLESSClarity After: CLEAR

Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_

7161 B

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Method: 8260B

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QL1024

Matrix: (soil/water) WATER

Lab Sample ID: QL1024-1

Sample wt/vol: 25 (g/ml) ML

Lab File ID: QL1024-1A51

Level: (low/med) LOW

Date Received: 08/10/01

% Moisture: not dec. \_\_\_\_\_

Date Analyzed: 08/17/01

GC Column: EQUITY624 ID: 0.53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL)

Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L Q

74-87-3-----	Chloromethane	0.5	U	
75-01-4-----	Vinyl Chloride	0.5	U	
74-83-9-----	Bromomethane	0.5	U	
75-00-3-----	Chloroethane	0.5	U	
75-35-4-----	1,1-Dichloroethene	0.5	U	
75-15-0-----	Carbon disulfide	0.5	U	
67-64-1-----	Acetone	3	U	<del>U</del> R
75-09-2-----	Methylene Chloride	0.2	JB	0.5U
156-60-5-----	trans-1,2-Dichloroethene	0.5	U	
75-34-3-----	1,1-Dichloroethane	0.5	U	
156-59-2-----	cis-1,2-Dichloroethene	0.5	U	
78-93-3-----	2-butanone	3	U	<del>U</del> R
67-66-3-----	Chloroform	0.5	U	
71-55-6-----	1,1,1-Trichloroethane	0.5	U	
56-23-5-----	Carbon Tetrachloride	0.5	U	
71-43-2-----	Benzene	0.04	J	
107-06-2-----	1,2-Dichloroethane	0.5	U	UJ
79-01-6-----	Trichloroethene	0.04	J	
78-87-5-----	1,2-Dichloropropane	0.5	U	
75-27-4-----	Bromodichloromethane	0.5	U	
10061-01-5-----	cis-1,3-Dichloropropene	0.5	U	UJ
108-10-1-----	4-Methyl-2-pentanone	3	U	UJ
108-88-3-----	Toluene	0.1	JB	0.5U
10061-02-6-----	trans-1,3-Dichloropropene	0.5	U	UJ
79-00-5-----	1,1,2-Trichloroethane	0.5	U	
127-18-4-----	Tetrachloroethene	0.5	U	
591-78-6-----	2-hexanone	3	U	<del>U</del> R
124-48-1-----	Dibromochloromethane	0.5	U	
108-90-7-----	Chlorobenzene	0.05	J	
100-41-4-----	Ethylbenzene	0.05	J	
108-38-3-----	m,p-Xylene	0.1	J	
95-47-6-----	o-Xylene	0.05	J	
100-42-5-----	Styrene	0.06	J	

FORM I VOA

SC 10801

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Method: 3260B

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QL1024

Matrix: (soil/water) WATER

Lab Sample ID: QL1024-1

Sample wt/vol: 25 (g/ml) ML

Lab File ID: QL1024-1A51

Level: (low/med) LOW

Date Received: 08/10/01

% Moisture: not dec. \_\_\_\_\_

Date Analyzed: 08/17/01

GC Column: EQUITY624 ID: 0.53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL)

Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-25-2-----	Bromoform	0.5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	0.5	U
106-46-7-----	1,4-Dichlorobenzene	0.1	J
540-59-0-----	1,2-Dichloroethene (total)	0.5	U
1330-20-7-----	Xylene (total)	0.2	J

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FORM I VOA

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract:

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QL1024

Matrix: (soil/water) WATER

Lab Sample ID: QL1024-1

Sample wt/vol: 1075 (g/mL) ML

Lab File ID: QL1024-1A64

Level: (low/med) LOW

Date Received: 08/10/01

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 08/13/01

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 08/14/01

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
111-44-4-----	Bis(2-chloroethyl) ether_____	8.9	U
106-44-5-----	4-Methylphenol_____	9.3	U
78-59-1-----	Isophorone_____	9.3	U
117-81-7-----	bis(2-ethylhexyl) Phthalate__	5.6	U

SC/0801



FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract:

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QL1024

Matrix: (soil/water) WATER

Lab Sample ID: QL1024-1

Sample wt/vol: 1075 (g/mL) ML

Lab File ID: QL1024-1A70

Level: (low/med) LOW

Date Received: 08/10/01

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 08/13/01

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 08/17/01

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

SPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CAS NO.

COMPOUND

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

87-86-5-----Pentachlorophenol

0.93

U

Sc 10801

FORM I SV

1D  
GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract: PCB 8082

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QL1024

Matrix: (soil/water) WATER

Lab Sample ID: QL1024-1

Sample wt/vol: 1075 (g/mL) ML

Lab File ID: \_\_\_\_\_

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Received: 08/10/01

Extraction: (SepF/Cont/Sonc) SEPF

Date Extracted: 08/14/01

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 08/15/01

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: \_\_\_\_\_

Sulfur Cleanup: (Y/N) N

CAS NO.

COMPOUND

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

12674-11-2-----	Aroclor-1016	0.46	U
11104-28-2-----	Aroclor-1221	0.93	U
11141-16-5-----	Aroclor-1232	0.46	U
53469-21-9-----	Aroclor-1242	0.46	U
12672-29-6-----	Aroclor-1248	0.46	U
11097-69-1-----	Aroclor-1254	0.46	U
11096-82-5-----	Aroclor-1260	0.46	U

uJ  
↓

Sc 10801

FORM I PEST

5-173

**September 5, 2001 Compliance Sample  
Laboratory Results**

SW-846

1-CC

## CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

EFFLUENT

Lab Name: CompuChem

Contract: \_\_\_\_\_

Lab Code: \_\_\_\_\_

Case No.: \_\_\_\_\_

NRAS No.: \_\_\_\_\_

SDC No.: QN1024Matrix (soil/water): WATERLab Sample ID: QN1024-1Date Received: 9/6/01% Solids: 0.00Concentration Units (mg/L or mg/kg dry weight): pH units

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
pH	7.920				9/7/01
TSS	1.00	U			9/7/01

Comments: \_\_\_\_\_

## ENVIRONMENTAL ANALYTICAL SERVICES

## FINAL REPORT OF ANALYSES

TEST AMERICA

Attn: SAM HARPER

4004 BARRETT DRIVE

SUITE 105

RALEIGH, NC 27609-

ACS 89

REPORT DATE: 09/17/01

SAMPLE NUMBER- 188167 SAMPLE ID- ACS 89 EFFLUENT

DATE SAMPLED- 09/05/01

DATE RECEIVED- 09/06/01 SAMPLER- COMPUCHEM

TIME RECEIVED- 1315 DELIVERED BY- SAM HARPER

SAMPLE MATRIX- WW

TIME SAMPLED- 1400

RECEIVED BY- JCF

Page 1 of 1

PROJECT NAME : ACS 89

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT UNITS	PQL
BIOCHEMICAL OXYGEN DEMAND	EPA 405.1	09/07/01	LEB	<2 mg/L	2

PQL = Practical Quantitation Limit

Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A.L.V.

10/10/01

## SW846 METALS

I

## INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBERTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: QN1024Matrix (soil/water): WATERLab Sample ID: QN1024-1Level (low/med): LOWDate Received: 09/06/01Solids: 0.0Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	55.2	B		P
7440-36-0	Antimony	1.7	U		P
7440-38-2	Arsenic	3.1	B		P
7440-39-3	Barium	59.4			P
7440-41-7	Beryllium	0.40	U		P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	57600			P
7440-47-3	Chromium	1.0	U		P
7440-48-4	Cobalt	0.70	U		P
7440-50-8	Copper	1.6	U		P
7439-89-6	Iron	10.6	U		P
7439-92-1	Lead	1.8	U		P
7439-95-4	Magnesium	19400			P
7439-96-5	Manganese	18.8			P
7439-97-6	Mercury	0.64	U		CV
7440-02-0	Nickel	3.6	B		P
7440-09-7	Potassium	6000			P
7782-49-2	Selenium	2.8	U		P
7440-22-4	Silver	0.50	U		P
7440-23-5	Sodium	39400			P
7440-28-0	Thallium	4.1	U		P
7440-62-2	Vanadium	0.60	U		P
7440-66-6	Zinc	1.8	B		P

Color Before: COLORLESSClarity Before: CLEAR

Texture: \_\_\_\_\_

Color After: COLORLESSClarity After: CLEAR

Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_

MH 10/15/9

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Method: 8260B

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QN1024

Matrix: (soil/water) WATER

Lab Sample ID: QN1024-1

Sample wt/vol: 25 (g/ml) ML

Lab File ID: QN1024-1A51

Level: (low/med) LOW

Date Received: 09/06/01

% Moisture: not dec. \_\_\_\_\_

Date Analyzed: 09/18/01

GC Column: J&W DB624 ID: 0.53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL)

Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

74-87-3-----	Chloromethane	0.5	U
75-01-4-----	Vinyl Chloride	0.5	U
74-83-9-----	Bromomethane	0.5	U
75-00-3-----	Chloroethane	0.5	U
75-35-4-----	1,1-Dichloroethene	0.5	U
75-15-0-----	Carbon disulfide	0.5	U uJ
67-64-1-----	Acetone	3	U R
75-09-2-----	Methylene Chloride	0.5	U uJ
156-60-5-----	trans-1,2-Dichloroethene	0.5	U
75-34-3-----	1,1-Dichloroethane	0.5	U
156-59-2-----	cis-1,2-Dichloroethene	0.5	U
78-93-3-----	2-butanone	3	U R
67-66-3-----	Chloroform	0.5	U
71-55-6-----	1,1,1-Trichloroethane	0.5	U
56-23-5-----	Carbon Tetrachloride	0.5	U
71-43-2-----	Benzene	0.5	U
107-06-2-----	1,2-Dichloroethane	0.5	U
79-01-6-----	Trichloroethene	0.5	U
78-87-5-----	1,2-Dichloropropane	0.5	U
75-27-4-----	Bromodichloromethane	0.5	U uJ
10061-01-5-----	cis-1,3-Dichloropropene	0.5	U uJ
108-10-1-----	4-Methyl-2-pentanone	3	U
108-88-3-----	Toluene	0.5	U
10061-02-6-----	trans-1,3-Dichloropropene	0.5	U uJ
79-00-5-----	1,1,2-Trichloroethane	0.5	U
127-18-4-----	Tetrachloroethene	0.5	U
591-78-6-----	2-hexanone	3	U R
124-48-1-----	Dibromochloromethane	0.5	U uJ
108-90-7-----	Chlorobenzene	0.04	J
100-41-4-----	Ethylbenzene	0.5	U
108-38-3-----	m,p-Xylene	1	U
95-47-6-----	o-Xylene	0.5	U
100-42-5-----	Styrene	0.5	U

FORM I VOA

11/10/1501

57

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Method: 8260B

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QN1024

Matrix: (soil/water) WATER

Lab Sample ID: QN1024-1

Sample wt/vol: 25 (g/ml) ML

Lab File ID: QN1024-1A51

Level: (low/med) LOW

Date Received: 09/06/01

Moisture: not dec. \_\_\_\_\_

Date Analyzed: 09/18/01

Column: J&W DB624 ID: 0.53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL)

Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

75-25-2-----	Bromoform	0.5	U UJ
79-34-5-----	1,1,2,2-Tetrachloroethane	0.5	U UJ
106-46-7-----	1,4-Dichlorobenzene	0.08	JB 0.5 UJ
540-59-0-----	1,2-Dichloroethene (total)	0.5	U
1330-20-7-----	Xylene (total)	0.5	U

FORM I VOA

01/10/15/01

58



FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract:

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QN1024

Matrix: (soil/water) WATER

Lab Sample ID: QN1024-1

Sample wt/vol: 1050 (g/mL) ML

Lab File ID: QN1024-1A64

Level: (low/med) LOW

Date Received: 09/06/01

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 09/08/01

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 09/09/01

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CAS NO.

COMPOUND

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

111-44-4-----Bis(2-chloroethyl) ether	9.1	U
106-44-5-----4-Methylphenol	9.5	U
78-59-1-----Isophorone	9.5	U
117-81-7-----bis(2-ethylhexyl) Phthalate	5.7	U

FORM I SV

8270C

4/10/15/01

10

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract:

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QN1024

Matrix: (soil/water) WATER

Lab Sample ID: QN1024-1

Sample wt/vol: 1050 (g/mL) ML

Lab File ID: QN1024-1B70

Level: (low/med) LOW

Date Received: 09/06/01

Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Extracted: 09/08/01

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 09/11/01

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CAS NO.

COMPOUND

CONCENTRATION UNITS:  
(ug/L or ug/Kg) UG/L

Q

87-86-5-----Pentachlorophenol

0.95

U

FORM I SV

Curio/11701

11

1D  
GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract: PCB 8082

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: QN1024

Matrix: (soil/water) WATER

Lab Sample ID: QN1024-1

Sample wt/vol: 1025 (g/mL) ML

Lab File ID: \_\_\_\_\_

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_

Date Received: 09/06/01

Extraction: (SepF/Cont/Sonc) SEPF

Date Extracted: 09/09/01

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 09/10/01

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

12674-11-2-----	Aroclor-1016	0.49	U
11104-28-2-----	Aroclor-1221	0.98	U
11141-16-5-----	Aroclor-1232	0.49	U
53469-21-9-----	Aroclor-1242	0.49	U
12672-29-6-----	Aroclor-1248	0.49	U
11097-69-1-----	Aroclor-1254	0.49	U
11096-82-5-----	Aroclor-1260	0.49	U

11/10/15/01

**APPENDIX B**  
**SEDIMENT ANALYTICAL DATA**

**August 21, 2001 Sediment Sample  
Laboratory Results**

1D  
GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SOILGWTP001

Lab Name: COMPUCHEM

Contract: PCB 8082

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: V2231

Matrix: (soil/water) SOIL

Lab Sample ID: V2231-1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: \_\_\_\_\_

Moisture: 48 decanted: (Y/N) N

Date Received: 08/22/01

Extraction: (SepF/Cont/Sonc) SONC

Date Extracted: 08/25/01

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 09/04/01

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: \_\_\_\_\_

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

12674-11-2-----	Aroclor-1016	62	U
11104-28-2-----	Aroclor-1221	82	U
11141-16-5-----	Aroclor-1232	62	U
53469-21-9-----	Aroclor-1242	43	U
12672-29-6-----	Aroclor-1248	43	U
11097-69-1-----	Aroclor-1254	73	P
11096-82-5-----	Aroclor-1260	62	U

W  
J  
WJ

10/18/01

**APPENDIX C**

**HISTORICAL WETLAND SEDIMENT ANALYTICAL DATA (MAY 1996)**

**TABLE 8**  
**PCB ORGANICS ANALYSIS SUMMARY**  
**Soil/Sediment Samples**  
**WETLAND INVESTIGATION**  
**AMERICAN CHEMICAL SERVICES, INC.**  
**GRIFFITH, INDIANA**

SAMPLE ID	Detected PCBs			Total PCBs
	aroclor-1248	aroclor-1254	aroclor-1260	
SD17	58 JP	150 P	140	348
SD18	--	--	--	--
SD18-91	--	--	--	--
SD19	13 JP	36 JP	16 JP	65
SD20	--	79 J	180 P	259
SD21	1,300 JP	8,700	3,100 P	13,100
SD22	560 JP	3,600	1,700	5,860
SD22-91	270 JP	1,800	830	2,900
SD23	770 JP	4,000	1,900	6,670
SD24	--	--	--	--
SD25	--	46 J	--	46
SD26	320 JP	1,700	1,900	3,920
SD27	48 J	190 P	270 P	508
SD28	220 J	1,200	970 P	2,390
SD29	180	380 P	330 P	890
SD29-91	84 P	450 P	570 P	1,104
SD30	74 P	570 P	390	1,034
SD31	61 JP	600	240 P	901
SD32	35 JP	79 P	73	187
SD33	27,000 P	63,000 P	35,000 P	125,000
SD34	--	14 JP	13 JP	27
SD35	2,700 JP	8,100 P	6,200 P	17,000
SD36	--	37 JP	--	37
SD37	--	--	--	--
SD38	30 JP	99 JP	100 P	229

Notes:

1. All results expressed in micrograms per kilogram (ug/kg).
2. "--" = compound was not detected above the quantitation limit
3. "J" = indicates an estimated concentration between the quantitation limit and the method detection limit
4. "P" = This flag is used for pesticide/arochlor target analyte when there is a greater than 25 percent difference for detected concentrations between the two GC columns.

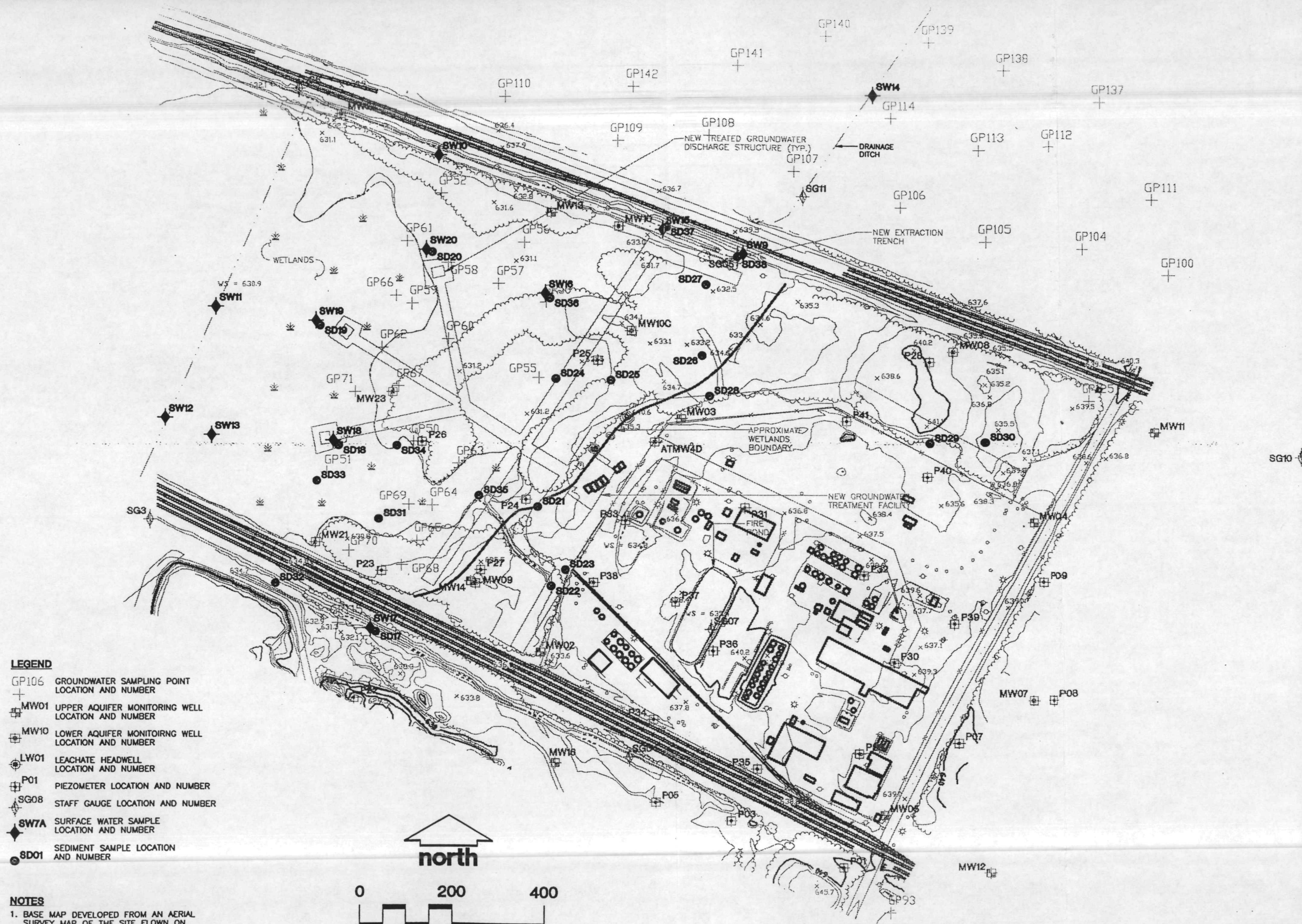
CCH/cch/SCI

j:\4077\0090\wetland\lab-data.xlw

PEST - soil



Management Review  
Technical Review  
Project Manager  
10-96  
Graphic Standards  
Lead Professional  
CONTROL  
or a  
development  
and may not  
be used without  
the written  
approval of  
Montgomery  
Watson.



- LEGEND**
- GP106 GROUNDWATER SAMPLING POINT LOCATION AND NUMBER
  - MW01 UPPER AQUIFER MONITORING WELL LOCATION AND NUMBER
  - MW10 LOWER AQUIFER MONITORING WELL LOCATION AND NUMBER
  - LW01 LEACHATE HEADWELL LOCATION AND NUMBER
  - P01 PIEZOMETER LOCATION AND NUMBER
  - SG08 STAFF GAUGE LOCATION AND NUMBER
  - SW7A SURFACE WATER SAMPLE LOCATION AND NUMBER
  - SD01 SEDIMENT SAMPLE LOCATION AND NUMBER

**NOTES**

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY MAP OF THE SITE FLOWN ON MARCH 8, 1994 BY GEONEX CHICAGO AERIAL SURVEY, INC. CONTOUR INTERVAL TWO FEET.

Developed By CCH  
Approved By CCH/PJV  
Reference  
Revisions

Drawn By CCM  
Date 7/26/96

**SAMPLING POINTS**  
WETLAND INVESTIGATION  
AMERICAN CHEMICAL SERVICE, INC.  
NPL SITE  
GRIFFITH, INDIANA

Drawing Number  
4077.007B2

**MONTGOMERY WATSON**

FIGURE 1